UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

11/18/98

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. John C. Stauter
Vice President-Environment, Safety and Technology
Kerr-McGee Corporation
Kerr-McGee Center
Oklahoma City, Oklahoma 73125

Dear Mr. Stauter,

Thank you for your letter of August 21, 1998. You indicated in your letter that the Agency has altered the definition of beneficiation in its May 26, 1998 mineral processing Land Disposal Restrictions (LDR) rulemaking (see 63 FR 28556). We have not changed the definition of beneficiation found in the September 1, 1989 rulemaking (see 54 FR 36623). However, the 1989 rulemaking does discuss how the Agency would apply the concept that mineral processing generally begins when there is a physical and/or a chemical change. The 1989 preamble specifically states the following:

> In considering the functional distinctions between beneficiation and processing using both heat and acid, EPA has examined both the range of actual practices employed, and the types of waste streams that are generated by these operations in various mineral commodity sectors. In a general sense, the lines that the Agency has drawn between beneficiation and processing parallel the common sense differences that can be observed between beneficiation and processing wastes generated using other types of mineral exploitation techniques. Most beneficiation processes, at least those immediately upstream from the initial processing operation in a production sequence, generate high volume solid waste streams that are essentially earthen in character. **Despite the fact that valuable constituents have been removed, the remaining material is often physically and chemically similar to the material (ore or mineral) that entered the operation, except that particle size reduction has often occurred. Processing operations, in contrast, generate waste streams that generally bear little or no resemblance to the materials that entered the operation (with the arguable exception of smelting slags). These operations most often destroy the physical structure of the mineral, producing product and waste streams that are not earthen in character.** ("emphasis added")

This excerpt from the 1989 preamble clearly notes that the Agency intends to use the concept of physical or chemical change to distinguish between beneficiation and mineral processing. The discussion explaining how the Agency makes Bevill determinations found in the preamble of the May 26, 1998 Land Disposal Restrictions (LDR) rulemaking and in the final technical background document entitled "Identification and Description of Mineral Processing Sectors and Waste Streams" is, therefore, consistent with the 1989 rulemaking.

You also mentioned that the Agency has reinterpreted the Bevill status of roasting in preparation of leaching. The Agency has not made any such reinterpretation. The preamble to the 1989 rule states:

> In the minerals industry, roasting serves primarily to change a sulfide ore to the oxide form, so that beneficiation by leaching or other subsequent steps may be more effectively performed. Functionally similar to roasting, autoclaving uses steam to perform heating activities (e.g., pretreating sulfide ore for leaching). For purposes of this rule, roasting and autoclaving are considered beneficiation operations if they are used to remove sulfur and/or other impurities in preparing an ore or mineral, or beneficiated ore or mineral, for leaching. Otherwise, roasting and autoclaving are defined as processing operations. Accordingly, activities such as roasting sulfide ores in preparation for precious metals heap leaching are considered beneficiation, **while roasting ores or concentrates in preparation for copper, lead, or zinc smelting is specifically defined as processing.** ("emphasis added")

The 1989 preamble makes it clear that roasting in preparation for leaching is a beneficiation activity, but that not all roasting is beneficiation. The 1989 rule also distinguishes between leaching (generally a beneficiation activity) and digestion (generally a mineral processing operation). If roasting is conducted prior to digestion, this activity is viewed by the Agency as mineral processing. The 1989 rule stated:

> Several additional operations employ heat in combination with various acids. In EPA's view, some of these operations constitute beneficiation while others are processing. The distinction hinges upon the difference between dissolving, washing, or otherwise purifying values contained within a mineral using a dilute acid solution (beneficiation) and attacking or digesting (i.e., destroying the structure of) the ore or mineral, or beneficiated ore or mineral, using a strong acid (processing). Acid dissolution, often accompanied by heat, is used as a precursor for many beneficiation operations (e.g., precipitation, fractional crystallization, ion exchange, solvent extraction). EPA recognizes this as an activity integral to many beneficiation operations, regardless of the application of heat or use of acid. For example, EPA recognizes acid washing and acid dissolution as beneficiation activities; concentrated sulfuric acid attack of titanium- or phosphate-bearing ores is considered a processing operation by the Agency.
>
> This common sense distinction is reflected in EPA's definitions of beneficiation and processing operations using heat and acid. The beneficiation operations (e.g.,

> calcining, dissolution, roasting in preparation for leaching) produce wastes, where applicable, that are essentially earthen and of relatively high volume. The processing operations (e.g., smelting, acid or alkaline digestion), on the other hand, produce wastes that are not earthen, bear little resemblance to the materials that entered the operation, and are of relatively lower volume.

This section of the preamble notes that the Bevill status of wastes from a roasting process depends on whether the subsequent step constitutes beneficiation or processing. The use of heat followed by digestion is a mineral processing activity, while the use of heat followed by acid dissolution is beneficiation.

In addition to these two questions, I understand that you may have concerns related to the regulatory status of wastes generated at your rutile processing facility. Please feel free to contact Stephen Hoffman at 703-308-8413 to facilitate any further discussions of this issue.

Sincerely,

Elizabeth Cotsworth
Acting Director